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In discussion, brief remarks were made by I. C. White, A. P. Brigham and A. W. Grabau.

In the absence of the authors the following papers were read by title:

Notes on Mts. Hood and Adams and their Glaciers: H. F. REID.

Keewatin and Laurentide Ice Sheets in Minnesota: A. H. ELFTMAN.

Devonian Interval in the Ozarks: C. R. KEYES.

Devonian Fish-Fauna of Iowa: C. R. EASTMAN.

Geological Section in Northern Alaska, along the 152d Meridian: FRANK C. SCHRADER.

Notes on the Geology of Southeastern Alaska: ALFRED H. BROOKS.

Geology of the Virgilina Copper District in Virginia and North Carolina: THOMAS L. WATSON.

Cuttyhunk Island: F. P. GULLIVER.

The Mohoaea caldera on Hawaii: C. H. HITCHCOCK.

A resolution of thanks to the president and trustees of the University of Rochester and to the professor of geology, the secretary of the Society, was offered by Professor Emerson, and after some remarks by Professor Coleman was unanimously adopted. After some closing remarks by the vice-president, the Society adjourned until December, 1902.

A large proportion of the fellows remained in Rochester to attend the evening reception given by President and Mrs. Rush Rhees, of the University of Rochester. The afternoon was devoted to short excursions to the Genesee gorge and other localities about Rochester, and to an inspection of the establishments of Ward's Natural Science Bureau, the Bausch and Lomb Optical Company, etc.

AMADEUS W. GRABAU.

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FORESTRY IN NEW YORK STATE.

THE New York State School of Forestry, located at the New York Land Grant College, with its laboratories in the form of trained man in this department in the Adirondacks, is discovering that the difficulties which have attended so generally the promotion of pure science in our colleges and schools, during the past generation and earlier, are not necessarily evaded or lessened when the question becomes one of promotion of applied science and the utilization of scientific method directly in the promotion of the highest interests of the State and of its people.

New York was the first of the States of the Union to provide, on a suitable working scale, for the introduction of the art of forestry into this country by systematic and scientific instruction in a technical college, purely and professionally devoted to that work. It established the 'College of Forestry' as a department of the State college, Cornell University, authorized the purchase of a large tract of forested land, gave directions that the work should be done under the supervision of an expert, scientific and practically trained forester, and conferred ample authority upon the College of Forestry, its director and the university board of trustees, to establish and permanently sustain the college and its work. The primary purpose of the college was the education of professionally trained foresters. This provision was made in 1898 and was at once put into operation. Land was purchased—outside the State Reservation and thus not subject to the constitutional limitations affecting that reservation—and work promptly begun.

Hardly had this long-needed and immensely important enterprise been inaugurated by the appointment of Director Fernow, the most experienced, professionally trained man in this department in the country, and the schedule of work and

study and laboratory practice determined upon than an opposition arose, on the part of interested and ignorant persons, that was as well organized and as savage as any attack upon Cornell University in its earlier days of *Sturm und Drang*. The management was accused of seeking to make the Adirondack tracts 'as barren as the top of Mount March,' of 'methods under which everything in the shape of wood, right down to shrubs, is being sold and cut,' of infringing upon the State preserve and the State Constitution. It was asserted that 'the land is being stripped as clean as ever it would be stripped by wood-pulp men, * * * cleared of everything but brush,' that one company is taking all the soft wood and another is 'taking the rest of the growth, right down to saplings'; and numberless other equally false and foolish tales reinforced the bill of complaint.

To this curious and unintelligent assault it became necessary to reply, as the newspapers had taken it seriously in many instances and a hue and cry was being raised which might very probably do much injury to the new enterprise, to the best interests of the State and to the reputation of the university and the college. Director Fernow has prepared an open letter regarding the matter from which we abstract the following:

The introduction in the United States of forestry methods in managing forest properties has been delayed by just such misconceptions, misstatements and misdirected attacks as characterize the lucubrations lately published in various newspapers regarding the doings of the College of Forestry in the Adirondacks.

THE SITUATION.

Cornell University was, by the State, invited to establish a College of Forestry, in which professional foresters were to be

educated, and at the same time there was given to it, as an experiment station in charge of the College of Forestry, a tract of land in the Adirondacks, from which the lumbermen had culled the pine and spruce. On this tract it was to show how such a culled hardwood forest might be managed under forestry principles.

The College of Forestry does *not* control the State forest reserve, has not even a voice in its management, nor is it operating on any State lands, the tract at its disposal having been deeded directly from the owners to Cornell University. While it would have a perfect right to cut the timber down to saplings, it does *not* do so, for good reasons.

WHAT IS FORESTRY?

Forestry, in simplest terms, means no more nor less with reference to wood crops than agriculture means with reference to food crops. It is a business which is concerned in the production of useful material, the most important and most widely used material, next to food materials. It is, then, entirely utilitarian. It is not concerned, at least directly, with the beauty of trees or with the shelter for game, although these aspects may be incidentally looked after. Also incidentally and more prominently must the influence of a forest cover on soil and water conditions be kept in view. This latter interest is directly important to the forester himself, since he must keep his ground in satisfactory productive condition, if he expects to be successful with his crop. The forester, then, looks on the forest as a crop and that involves *reaping as well as planting*.

THE FORESTER A HARVESTER.

He is a logger as well as a sower; he uses the axe as well as the spade and dibble. He uses the axe even more than the planting tools, for under certain conditions he

may, by judicious management in the cutting of the old crop, secure the new crop by the seeds falling from the old trees before he removes them.

This is the difference between the lumberman and the forester. The lumberman simply reaps nature's product, takes the best trees, the best cuts, and leaves the rest in possession of the soil for nature to do with it as it pleases, either to let it grow up to weeds and brush or to recover the soil, in due time reproducing another crop. The forester has the obligation, when he reaps, to provide *systematically* for a new crop; not the chance volunteer crop of nature, but one of economic value, of species that are most useful, in larger quantity and better form and in shorter time than nature, unaided, could or would produce.

If the College of Forestry were only logging its tract as the lumberman does, it would, indeed, be remiss in doing its duty.

If the college were only doing what is proposed to be done on certain parts of the State Forest Reserve, namely, to cull out the valuable spruce and leave the hardwoods altogether, it would still be remiss in its duty, for while, to be sure, the charge of denuding the land could not be brought, there would not be any good forestry practice in merely reducing the most valuable part of the crop and its chances of reproduction.

REPRODUCTION THE KEY-NOTE OF FORESTRY.

The forester may not harvest his crop without systematically providing for reproduction, replacing the harvested crop by a crop, if possible, superior in composition. This can be accomplished in more than one way, and the choice of method depends on many considerations which have reference not only to the condition in which the forest manager finds the forest property that he is to manage, but also to the con-

dition of the finances which are to back him in this business of forest cropping.

Where the lumberman has culled the desirable kinds and left the inferior, or comparatively less valuable ones, in possession of the soil, as is the case in most parts of the college tract, it stands to reason that, if the former are to be reestablished, it can only be done by reducing the latter and replanting artificially those we would wish to be most prominent in our new crop. Where the desirable kinds are still present, a new crop may be reproduced from the seeds of these, gradually removing the old trees as the young crop needs light. The College of Forestry proposes to use both methods, separately and in combination, taking advantage of any volunteer growth present, and leaving the volunteer growth of young saplings of hardwoods, conifers and older seed trees where desirable, and planting in pines and spruces to fill up the natural reproduction.

FOREST PRESERVATION BY REPRODUCTION.

The operations of the college last year extended over an area of less than 500 acres, of which it is estimated about 300 need planting. Owing to the unfavorable winter, operations were delayed, so that planting ground could be made ready only to the extent of 105 acres, which were planted. The nurseries established contain now material sufficient to plant 500 acres next spring, if the means for doing this planting can be had. Burnt and waste lands have also been planted, so that some 225 acres are now planted. In fact, counting by numbers, the college has, so far, planted 100 trees for every four trees cut. These are as many as its scanty resources permitted. It is, therefore, following the main precept of forestry to reproduce the crop. The charge that it is cutting down to mere saplings is truly puerile, for, while there would be no impropriety in doing

this, provided the crop were properly replaced, there is no market for such saplings. The story comes probably from the observation that small brushwood of the felled trees has been cut and bundled as an experiment, to see whether it could not be made useful.

THOROUGH UTILIZATION.

The lumberman, it is well known, cuts and utilizes only the logs, and those of the best trees and kinds, leaving a large part of the trees he has felled on the ground as *debris*, to feed the fires and prevent young growth. The forester is forced, by the mandates of his business, to utilize as much as possible not only the poor trees, but all that is in a tree; not only the logs of the best, but of the weed trees as well, and the cordwood and the brush, if he can; or else he may have to burn the brush later. Thorough utilization, instead of the wasteful one which the mere logger practices, distinguishes the forester's work. Unfortunately, there is no market for this inferior material, which a satisfactory silviculture requires to have removed. The College of Forestry is at least trying to satisfy, as far as possible, this requirement.

WHERE THE PROFITS GO.

The charge that the logging operations are carried on for the financial benefit of Cornell University is even more puerile, for, if there were any profits to be derived from the sale of the crop, the State has carefully guarded against having them applied for any other purpose than the one in hand, namely, the running of this demonstration or experiment station and the replacement of the crop. It is absolutely impossible for Cornell University to make any profits from the College Forest, since all returns are at once turned over to the State Treasurer for the purpose aforesaid. As a matter of fact, the finances of the college experiment station are not such as

to make anyone who knows them envious. Much more work in planting and improvement generally would have been done if finances permitted; that is, if the State had appropriated a more liberal working fund, such as had been asked for. Any business man knows that a certain working capital is required to carry on a given business; if this is below a certain figure, the business can only be carried on in a lame way and at a disadvantage.

INSUFFICIENT FUNDS.

This is the condition of the College Forest management; it is trying with an insufficient capital to earn what is necessary to pay for the administration and the improvements, including planting. A lumberman, logging these hardwoods, would find it difficult to make a satisfactory margin; a forester, who is obliged to log with more care and to replace the crop he has cut, necessarily works under greater financial disadvantages, and, so far, it has only been possible with great economy and care of the finances to secure any margin which can be applied to the forestry work.

The wise policy for the State, if it wished this experiment in forest management properly carried on, would have been either to make provision for annual appropriations for its conduct or to provide a sufficient working fund on which to run the experiment as a business. In my last annual report I stated that the modest fund of \$50,000 was asked, but only \$30,000 was allowed, which would hardly suffice to carry on a logging operation. To place the experiment on a proper basis, to permit the development of means of transportation from all parts of the property, which alone would make possible the method of gradual removal and reproduction by natural means, a working capital of not less than \$150,000 should be placed at the disposal of the management.

WHO ARE THE OBJECTORS?

It remains, then, to state that the College of Forestry is doing what it is set to do. It is harvesting from an area from which the valuable part has been already removed, the old, decrepit hardwood crop which is rotting and becoming less and less valuable, and is replacing it by a young, vigorous crop of better composition. It is doing this by trying to make the old crop pay for the new; that is, carrying on the experiment like a business venture.

It may be of interest to inquire whence the opposition to its procedure comes.

There are those who have used this property as a hunting ground, and naturally desire to preserve it as such for their own personal benefit. They are opposed to the change from old timber to young plantation, which only in years will again give them a hunting ground.

Again, there are those sentimentalists who consider it a sin to cut a tree, overlooking that their houses could not be built and their homes furnished without the utilization of the forest.

There are those who mistake the situation and think it is the State's Forest Reserve that is being cut over. Moreover, as they have made up their minds that forest preservation is only to be had from non-use, the forest preservation practiced by the college, which lies in the philosophy that all life is efficiently preserved only by reproduction, does not appeal to them.

There may also be those who know only one way of treating a forest, and hence, differing as doctors do, criticise the method of artificial reproduction by planting, which the college is in part forced, in part has chosen, to follow. These recognize only the culling process, which the lumberman has practiced with the softwoods, as legitimate; and advocate even that the State practice it in the Forest Reserve on its virgin lands, and cull out the valuable

spruce in order to make the reserve of financial use.

While, no doubt, the gradual removal system has some advantages, if properly applied, it means, when applied to hardwoods, which cannot be transported by water, the development of an extensive system of railroad transportation, which requires funds such as the college has not had at its disposal.

NO FEAR FOR THE PRESERVE.

The college is doing what it can do, under the circumstances surrounding the problem, on practical business lines. It was set to doing a definite, limited task. It has no control of, no voice in, no relation to, the management of the State Forest Preserve, and would not, if it had, advocate the application of its methods to the State Preserve. For the objects of the State Preserve are entirely different from those which the college tract is to serve, and hence what is proper to do on an area set aside for demonstration is by no means proper to do or directly applicable on an area set aside primarily for soil protection and recreation.

Hence no fear need be entertained that the State Preserve is in danger of being denuded through the agency of the college. On the contrary, the college hopes to influence the management of the Adirondack Preserve in the very opposite direction. It hopes that its success in reforesting burnt and waste areas will stimulate the State authorities to do likewise. This fall the college presented to the Forest, Fish and Game Commission several thousand pine and spruce seedlings, which were planted by an agent of the Commission and by interested landholders in the Catskill Reserve.

As a result of this first beginning the Forest Commission has just contracted with the College of Forestry for 420,000

conifer seedlings to be furnished from the nurseries of the College Forest and to be planted on waste areas in the Adirondack Preserve.

Dr. Fernow's explanation should suffice not only to convince the intelligent but misled reader of the shameful attack against which he protests—and which, we observe, was telegraphed from Watertown—but even to instruct the most ignorant and thoughtless, if not to silence the selfish, obstructors of a policy which has commenced none too soon its endeavor to remedy the apparently irretrievable and fatal mischief which has done so much to bring upon the State and the nation all the grievous results of deforestation. This is one of those matters of applied science which is of such overwhelming importance as to justify the nation in making any sacrifice of time and money, the State in meeting every minutest requirement of its Forester and the people in silencing promptly and effectively every unpatriotic citizen who seeks to make the highest interests of the State subservient to his own individual petty desires.

FIELD WORK OF THE ETHNOLOGICAL DIVISION OF THE AMERICAN MUSEUM OF NATURAL HISTORY IN 1901.

IN the past year the principal part of the field work of the Jesup North Pacific Expedition, which was organized in 1897, has been brought to a close. Parties were in the field in the interior of British Columbia, on Vancouver Island, on Queen Charlotte Islands, and in northeastern Siberia. Mr. James Teit continued his studies and collections among the Thompson Indians and their neighbors. Mr. George Hunt was at work in northern Vancouver Island.

The principal undertaking of the expedi-

tion on the Pacific coast of America was a thorough investigation of the Haida Indians of Queen Charlotte Islands, which was intrusted to Dr. John R. Swanton. Dr. Swanton went to Queen Charlotte Islands in September, 1900, and stayed among the Haida for more than a year. His work was eminently successful. He succeeded in unravelling the intricate social organization of the tribe, and in giving, for the first time, thoroughly satisfactory explanations of the significance of totem poles. He also collected much information on the customs and beliefs of the people, and brought back an immense mass of mythology, recorded in both dialects of the native language, as well as grammatical notes sufficient to give a clear insight into its structure.

Unfortunately the interesting art of the Indians of Queen Charlotte Islands has practically disappeared. The raids of collectors such as Swan, Jacobsen, not to mention the later inroads of traders and other collectors, have been such that hardly an article of the old objects of this tribe is left. This condition hampered Dr. Swanton very considerably, in so far as it made his work of obtaining interpretations and explanations of objects impossible. Although he took with him a large number of sketches and photographs of masks, rattles and other objects of Haida provenience, it was found almost impossible to obtain explanations for any of these, because the owners and users of these objects either were dead or could not be found.

The Siberian department of the expedition was in charge of Mr. Waldemar Jochelson. The party consisted of Mr. and Mrs. Jochelson, Mr. and Mrs. Bogoras, and Mr. Alexander Axelrod. The party was accompanied by Mr. Buxton, who was in charge of the zoological work. The expedition took the field in the spring of 1900. Mr. and Mrs. Bogoras, Mr. Axelrod and Mr. Buxton returned a few weeks ago,